



4N57 Numeric Display With Logic

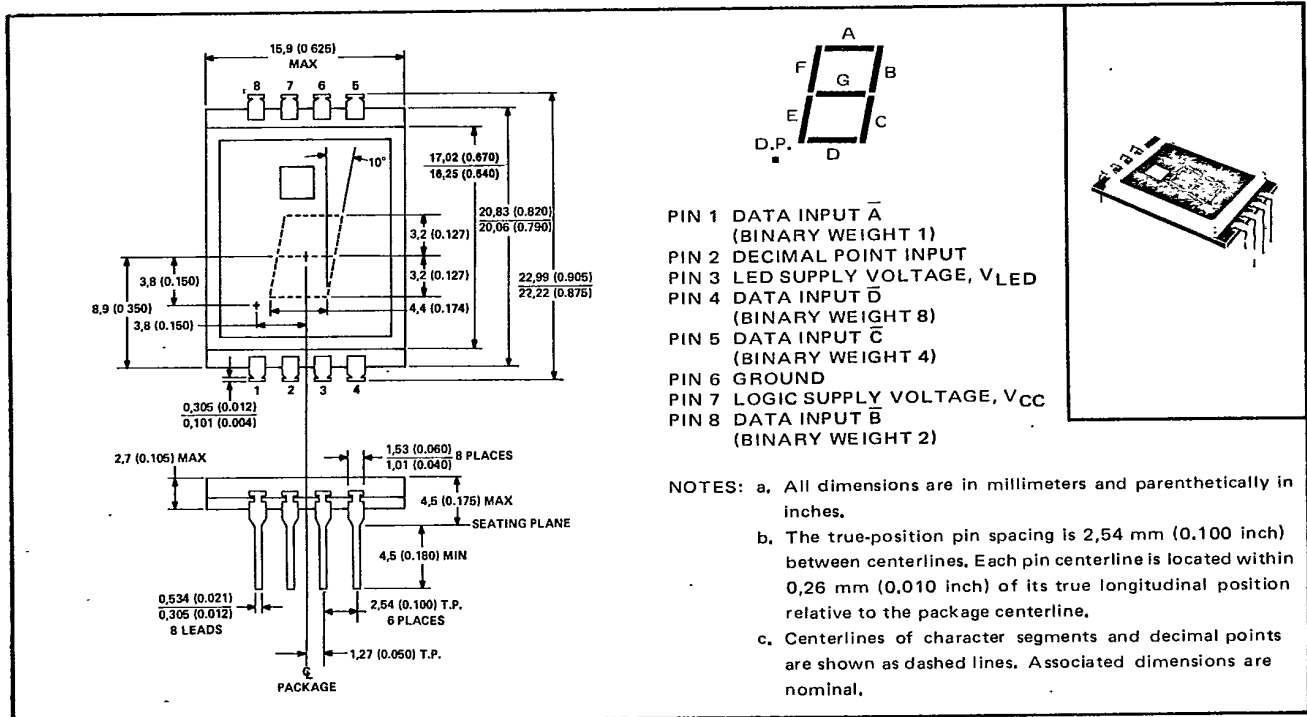
HERMETICALLY SEALED SOLID-STATE SEVEN-SEGMENT DISPLAY WITH TTL DECODER/DRIVER

T-41-37

- Withstands Military Environmental Conditions
- 7,62-mm (0.300-Inch) Character Height
- Internal TTL MSI Chip with Decoder and Driver
- BCD Four-Line Input
- Wide Viewing Angle
- High Luminous Intensity
- Left-Hand Decimal
- Constant-Current Drive for Light-Emitting Diodes
- Compatible with Most TTL Circuits

***mechanical data**

The display and TTL logic chip are mounted on a ceramic header, which is then hermetically sealed to a glass window. Multiple displays may be mounted on 15.9-mm (0.625-inch) centers.



***description**

The 4N57 contains a seven-segment numeric display with left-hand decimal and a TTL MSI BCD-to-seven-segment decoder and driver. It accepts four-line binary-coded-decimal (BCD) input in negative logic and displays the decimal number in a seven-segment format. Invalid inputs are automatically blanked (see function table). A low-logic-level voltage (≤ 0.8 V) at the decimal point input turns on the decimal independently of the BCD inputs. The decimal point, as well as each segment, is driven by a constant current from the logic chip. Varying the LED supply voltage will not significantly affect the brightness of the display. The brightness may be controlled by pulse-width modulation of the BCD inputs alternating between a valid code and an invalid code (e.g., all inputs low).

*JEDEC registered data. This data sheet contains all applicable registered data in effect at the time of publication.





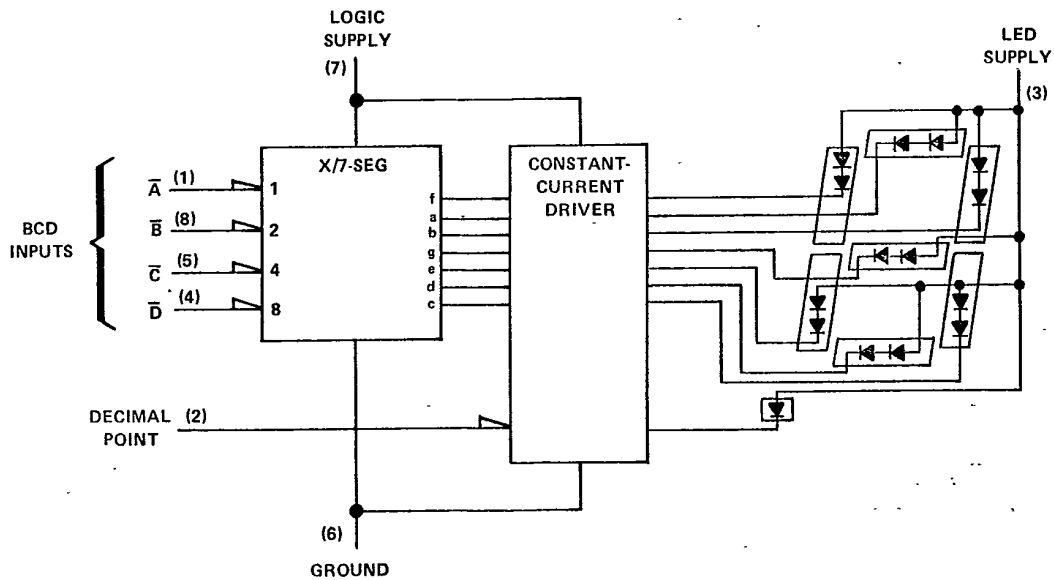
4N57 Numeric Display With Logic

FUNCTION TABLE

FUNCTION	DATA INPUTS					DISPLAY
	\bar{D}	\bar{C}	\bar{B}	\bar{A}	\overline{DP}	
0	H	H	H	H	H	0
1	H	H	H	L	L	.1
2	H	H	L	H	H	2
3	H	H	L	L	L	.3
4	H	L	H	H	H	4
5	H	L	H	L	L	.5
6	H	L	L	H	H	6
7	H	L	L	L	L	.7
8	L	H	H	H	H	8
9	L	H	H	L	L	.9
BLANK	L	H	L	H	H	.
BLANK	L	H	L	L	L	.
BLANK	L	L	H	H	H	.
BLANK	L	L	H	L	L	.
BLANK	L	L	L	H	H	.
BLANK	L	L	L	L	L	.

H = high logic level, L = low logic level
 \overline{DP} input has arbitrarily been shown activated (low) on every other line of the table.

*functional block diagram



*JEDEC registered data.





Numeric Display With Logic

*absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Logic Supply Voltage, V _{CC} (See Note 1)	7 V
LED Supply Voltage, V _{LED} , at (or below) 70°C Free-Air Temperature (See Note 2)	5.5 V
Data Input Voltage	5.5 V
Operating Free-Air Temperature Range	-55°C to 100°C
Storage Temperature Range	-65°C to 125°C

NOTES: 1. Voltage values are with respect to the ground terminal.
 2. For operation above 70°C free-air temperature, refer to LED Supply Voltage Derating Curve, Figure 1.

*recommended operating conditions

	MIN	NOM	MAX	UNIT
Logic Supply Voltage, V _{CC}	4.5	5	5.5	V
LED Supply Voltage, V _{LED} (See Figure 1)	4	4.6	5	V
High-Level Input Voltage, V _{IH}	2			V
Low-Level Input Voltage, V _{IL}			0.8	V
Operating Free-Air Temperature, T _A	-55		100	°C

LED SUPPLY VOLTAGE DERATING CURVE

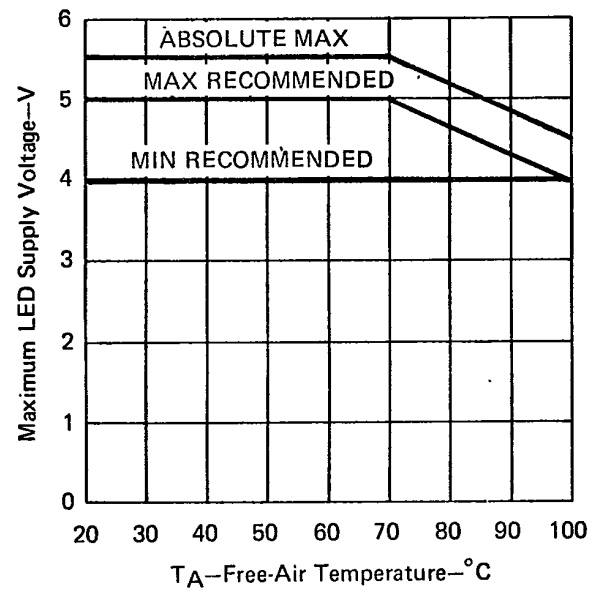


FIGURE 1

*operating characteristics at 25°C free-air temperature

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
I _v	Luminous Intensity (See Note 3)	V _{CC} = 5 V; V _{LED} = 4.6 V, See Note 4	Figure B		700	μcd
			Decimal Point		40	
λ _p	Wavelength at Peak Emission		640	660	680	nm
Δλ	Spectral Bandwidth		20			nm
V _{IK}	Input Clamp Voltage	V _{CC} = 4.5 V, I _I = -12 mA			-1.5	V
I _I	Input Current at Maximum Input Voltage	V _{CC} = 5.5 V, V _I = 5.5 V			1	mA
I _{IH}	High-Level Input Current	V _{CC} = 5.5 V, V _I = 2.4 V			20	μA
I _{IL}	Low-Level Input Current	V _{CC} = 5.5 V, V _I = 0.4 V			-0.8	mA
I _{CC}	Logic Supply Current	V _{CC} = 5.5 V, V _{LED} = 5 V,			75	mA
I _{LED}	LED Supply Current	DP at 5 V, Other inputs at 0 V			160	mA

NOTES: 3. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (International Commission on Illumination) eye-response curve.
 4. These parameters were measured with all LED segments and the decimal point on.

*JEDEC registered data.

